Monitor Mercury Detection

Detects if there is mercury inside of a monitor or not. The technology will be used to help the environment by preventing mercury from being recycled in a wrong way.

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Context of use: Education
Level of education: Bachelor

Impact on society

What impact is expected from your technology?

What is exactly the problem? Is it really a problem? Are you sure?

The problem is that mercury containing monitors and screens get wrongly classified as not containing any harmful substance. These misclassified monitors then get incorrectly recycled, leading to accidents in factories and also harming the environment.

Are you sure that this technology is solving the RIGHT problem?

The AI models that are being created for this problem, will help solve it by improving the chances of monitors being classified correctly.

How is this technology going to solve the problem?

It is going to use AI models to predict if a monitor contains mercury or not. The prediction is more accurate than what factories currently predict.

What negative effects do you expect from this technology?

A possible negative effect could be that monitors get misclassfied as having no mercury, while they actually do. We thought about this and created a bias towards monitors having mercury.

In what way is this technology contributing to a world you want to live in?

The technology contributes by reducing environmental damage due to factories. It will improve life by reducing the risk of our world being damage beyond repair.

Now that you have thought hard about the impact of this technology on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.

We would like the technology to be more accurate by improving the models. This could be done by gathering more data of monitors.

Besides that, the technology is not in actual use, so improvements would be to have a more widespread implementation.

Hateful and criminal actors

What can bad actors do with your technology?

This category has not been filled yet.

Privacy

Are you considering the privacy & personal data of the users of your technology?

This category is not applicable for this technology.

Human values

How does the technology affect your human values?

This category is not applicable for this technology.

Stakeholders

Have you considered all stakeholders?

This category has not been filled yet.

Data

Is data in your technology properly used?

This category is only partial filled.

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?

There is a big chance that the data that the client collected could have been misclassified during the seperation process. Besides that the dataset currently is quite small, which means the results of the models might not be 100% trustworthy.

How does the technology organize continuous improvement when it comes to the use of data?

This question has not been answered yet.

How will the technology keep the insights that it identifies with data sustainable over time?

This question has not been answered yet.

In what way do you consider the fact that data is collected from the users?

This question has not been answered yet.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.

This question has not been answered yet.

Inclusivity

Is your technology fair for everyone?

This category has not been filled yet.

Transparency

Are you transparent about how your technology works?

Is it explained to the users/stakeholders how the technology works and how the business model works?

How the technology works is explained in the notebooks and reports we have written. The results are clear and reproducible using documentation.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?

Yes, the decision is based on multiple aspects. For the CNN model there are visualisations which show what the model looks at. As for the other models it is explainable through graphs and results.

Is it possible to file a complaint or ask questions/get answers about this technology?

The client will be taking over the technology. They are a company with many employees, so they should be able to handle any questions about it. The client also has a good understanding of how the technology works.

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?

Yes, the potential shortcomings are all explained in our reports.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

The only improvements that could be made are to do more Explainable AI on how the model does predictions.

Sustainability

Is your technology environmentally sustainable?

This category is only partial filled.

In what way is the direct and indirect energy use of this technology taken into account?

The technology basically runs in realtime and does not take a very long time to train, for improving the model.

Do you think alternative materials could have been considered in the technology?

The materials in this technology are basically just a couple of files, which could run on a computer.

Do you think the lifespan of the technology is realistic?

This technology could be used for many years, but it could always be improved in the future.

What is the hidden impact of the technology in the whole chain?

This question has not been answered yet.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.

This question has not been answered yet.

Future
Did you consider future impact?

This category is only partial filled.

What could possibly happen with this technology in the future?
The environment could be positively impacted by this technology in the future. People would have a better life in their living environment.

It will also save a lot of damages and costs for factories, preventing hazardous monitors being recycled wrongly. This could also affect the people working there.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one utopian scenario.
This question has not been answered yet.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one dystopian scenario.
This question has not been answered yet.

Would you like to live in one of this scenario's? Why? Why not?
This question has not been answered yet.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?
I would definitely consider having the technology be bought out. The impact of this technology is very good in a positive way and there is basically no scenario where buyers would want to use the technology in a different way than it was intended to.

Impact Improvement: Now that you have thought hard about the future impact of the technology, what improvements would you like to make? List them below.
This question has not been answered yet.